which were secured in Northern Kansas in the autumn of 1894 (Fig. 5). It comes from the famous quarry which has supplied several museums with more or less complete collections. From various accounts, and especially from our own observations, it appears that this quarry represents an old bone bed, probably the deposit of some stream or small river, along which the rhinoceroses herded in great numbers. Our party secured here over 400 complete bones, representing mingled remains of both sexes and of all sizes. Only in certain spots was the proximity of one specimen to another found to be a proof of association. By careful study of such occasional associations and selection of bones representing only the largest and oldest individuals, a skeleton was gradually brought together, which is believed to represent very nearly the correct proportions of this exceptional type. The dimensions are: length, 10 feet 2 inches; height at withers, 4 feet 1 inch; and greatest girth, 9 feet 2 inches. It thus appears that from head to tail *Teleoceras fossiger* was only six inches shorter than *Rhinoceros unicornis*, while the back is 18 inches nearer the ground. This remarkable lowering of the trunk is chiefly caused by the great reduction of the fore-arm, fore-leg, and metapodials. The abdominal girth exceeds that of the Indian rhinoceros, justifying Cope's assertion that this animal had rather the proportions of the hippopotamus than of the existing rhinoceros. Osborn and Scott undertook a restoration of the skeleton of this animal in 1890, but did not venture to give the ribs their full length, as they far exceeded those of any existing form. The length of rib as here shown is, however, beyond question. By comparison of this mount with those preceding, it will be seen that it presents a very marked advance in the method of mechanical construction. The only visible supports are the vertical uprights and the horizontal pieces holding the ribs. All the remaining supports are of steel, and consist of rods which traverse the centre of the various bones, even of the delicately arched ribs, and are thus entirely concealed. This method, which appears to be the most perfect of its kind, would be, however, impracticable in skeletons coming from the older Eocene rocks, which are composed of very much denser material.

Altogether there are now thirteen mounted skeletons exhibited in the Museum, and fifteen others are in various stages of preparation.

Henry F. Osborn.

NOTES.

We have been asked by Prof. Meldola, the Hon. Organising Secretary to the Sylvester Memorial, to state that this Fund has now been closed, the subscriptions amounting altogether to over 890*l.* The capital sum has been invested by Lord Rothschild, the Treasurer of the Fund, on behalf of the subscribers, and the dividends will be transmitted to the Treasurer of the Royal Society. The engraving of the dies has been entrusted to Mr. John Pinches, and it has been decided that the material of the medal shall be bronze, that the award shall be triennial and irrespective of nationality, and that the recipient of the medal shall receive the accumulated (triennial) interest of the Fund, after deducting the cost of striking the medal. An autotype print of the medal will be presented to the subscribers by Prof. J. M. Peirce (of Harvard University) as soon as the dies have been engraved.

The Geological Society of London will this year award its medals and funds as follows:—The Wollaston Medal to Prof. Charles Lapworth; the Murchison Medal to Mr B. N. Peach, and a second Murchison Medal to Mr. John Horne; the Lyell Medal to Lieut.-General C. A. McMahon: the Bigsby Medal to Prof. T. W. Edgeworth David; the Wollaston Fund to Prof. J. B. Harrison; the Murchison Fund to Mr. James Bennie; the Lyell Fund is divided between Mr. Frederick Chapman and Mr. John Ward.

The Institution of Electrical Engineers has made the following awards for papers read during the session 1897–98:—The Institution Premium to Mr. Horace F. Parshall, for his paper on earth returns for electric tramways. The Paris Electrical Exhibition Premium to Mr. Robert Hammond for his paper on the cost of generation and distribution of electrical energy. The Fahie Premium was not awarded because no telegraphic or telephonic papers had been read during the session. Extra Premium to Mr. Leonard Andrews, for his paper on the prevention of interruptions to electricity supply. Premium for original communications, to Mr. H. N. Allen, for his paper on sparkless reversal in dynamos. Students Premiums were awarded to Mr. J. M. Donaldson for his paper on the Dover electric tramways; Mr. Maurice Solomon, for his paper on Hertz waves and wireless telegraphy; and Mr. E. E. Tasker, for his paper on alternate current motors. Salomons Scholarships were awarded to Mr. Tom Rolls Renfree, King's College, London, and Mr. H. J. Tomlinson, University College, London.

A short account of the recent celebration of the centenary of the St. Petersburg Military Medical Academy is given in the current number of the *Lancet*. The celebration commenced on December 30, 1898, when the congratulatory addresses of the presidents were presented. On Sunday, January 1, a visit was paid to the large non-military hospital associated with the Imperial Academy and to the Physical Laboratory, over which the delegates were shown by Dr. Danilevsky, who exhibited many experiments with liquid air, and demonstrated an apparatus by Zeiss by means of which images of small opaque bodies could be perfectly reproduced upon the lecturer's blackboard or screen. The chief part of Monday, January 2, was spent in a tour of inspection through the immense establishment on the islands at which all the instruments, splints, dressings, and apparatus are made for the army. On Wednesday, January 4, a miniature review was held by the Czar in an enormous riding school, and on its conclusion the delegates had the honour of being presented one by one to his Imperial Majesty. The British representatives were Rev. H. S. Cronin, Mr. Cross, Dr. Ferguson, Prof. Ogston, Mr. Owen, and Prof. Shipley. Throughout the entire series of functions the Minister of War showed by his presence that he deemed the Army Medical Department of real importance to his country. He expressed considerable pleasure at receiving congratulatory remarks from his visitors. It evidently gave him particular satisfaction to read out at the banquet before 500 guests a congratulatory telegram which arrived from the German Emperor.

The *Lancet* states that on the occasion of the recent jubilee of the St. Petersburg Academy of Medicine, the following British men of science have been appointed honorary members of the Academy:—Sir William MacCormac, Bart.; Sir William Turner, Lord Rayleigh, Sir William Stokes, Dr. William MacEwen, and Drs. Thompson and Lauder Brunton.

Prof. Chantemesse, of the Pasteur Institute, Paris, has been promoted to the grade of Officer of the Legion of Honour.

Prof. Alexander G. R. Foulerton has been appointed bacteriologist to the Middlesex Hospital.

Prof. Poincaré has been nominated president of the French Bureau des longitudes, M. Faye, vice-president, and Prof. Lippmann, secretary.

MR. J. G. BAKER, F.R.S., has retired from the post of curator of the Herbarium at Kew, in which he is succeeded by Mr. W. Botting Hemsley, F.R.S.

PROF. G. H. DARWIN, F.R.S., has been nominated president of the Royal Astronomical Society, for election at the annual meeting on February 10. Mr. F. W. Dyson has been nominated to succeed Prof. Turner as secretary.

WITH a view to encourage inoculation among its servants, the Madras Government has authorised the grant of three days' casual leave on full pay to those inoculated. The operation is purely voluntary. Similar concessions are granted to those attending the Government and aided schools.

IT is reported that an extraordinary long-distance telephone test has been made at Little Rock, Arkansas, by President Chas. J. Glidden, of the South-Western Telegraph and Telephone Company, who held a conversation over the wire with a Boston friend. The distance from Little Rock to Boston is 1900 miles.

THE Automobile Club de France announces a competition for motor-car accumulators, to take place in Paris in April next. Tests will be made on the life of the cells, and on their useful efficiency; and account will be taken of the "frequency, importance, and facility of operations for maintenance," and of the weight of the cells.

WE learn from *Science* that Prof. G. W. Farlow, of Harvard University, has been elected president of the American Society of Naturalists; Prof. R. S. Woodward, of Columbia University, has been elected president of the American Mathematical Society, in succession to Prof. Simon Newcomb; and Prof. John Dewey, of the University of Chicago, has been elected president of the American Psychological Association.

REUTER reports that the eruption of Vesuvius on January 15 attained great proportions, the flow of lava being greater than any which has hitherto occurred. Streams of lava are flowing down the mountain side, one passing near the observatory and another going in the direction of the lower station of the funicular railway.

THE death is announced of Dr. Constantine Vousakis, professor of physiology in the University of Athens.

THE death is announced of Brigade-Surgeon Lieut.-Colonel Robert Pringle, late of the Indian army. Lieut.-Colonel Pringle was for many years attached to the sanitary department of the North-West Provinces and Oudh, and took a keen interest in all problems connected with public health, especially in relation to India. He was the author of numerous papers and pamphlets contributed to medical journals, the Society of Arts, sanitary conferences, and other places.

THE death of Prof. Wilhelm Dames, professor of geology and palæontology at the University of Berlin, in his fifty-sixth year, is announced in the *Athenaeum*. He was a pupil of Beyrich, and succeeded him in 1896 as director of the geological-palæontological collection. Amongst his many scientific publications, his studies upon fossil fishes stand in the foreground. Since 1883 he had been the co-editor with E. Kayser of the Berlin *Paläontologische Abhandlungen*.

DR. GOTTLIEB GLUGE, Emeritus professor of physiology and anatomy in the University of Brussels, has (says the *Lancet*) died at Nice, aged eighty-six years, having been born in Westphalia in 1812. While a student in Berlin he worked with Froriep, who was prosector at the Charité, and discovered the oil globules in cells undergoing fatty degeneration. After a period of study in Paris he published an important paper on influenza treated historically and pathologically, for which he was awarded a prize by the Berlin Medical Faculty. In 1838 he was appointed professor of physiology in Brussels. His "Atlas of Pathological Anatomy" appeared in parts from 1843 to 1850. For the last twenty-three years he had been living in retirement.

The *Times* correspondent at Washington states that Prof. Worcester, of Michigan University, has been asked to be a member of the commission which President McKinley will send to the Philippines. It is understood that the commission will study the manners and habits of the Filipinos, the material resources of the country, and its commercial possibilities, but will not attempt to deal with the problem of its government. Dr. Schurman, president of Cornell University, will be president of the commission, which is expected to sail about February 1.

AN abstract of a report on the mineral resources of the Philippine Islands, sent by Dr. George F. Becker to the U.S. Geological Survey, is published in *Science*. Dr. Becker says that, so far as is definitely known, the coal of the Philippine Islands is all of the Tertiary age, and might better be characterised as a highly carbonised lignite. Lignite is widely distributed in the archipelago; some of the seams are of excellent width, and the quality of certain of them is high for fuel in this class. Coal exists in various provinces of the Island of Luzon, and a number of concessions for mining have been granted. Many of the other islands contain coal, and in the great Island of Mindanao it is known to occur at eight different localities. In the Island of Cebu petroleum has been found associated with coal at Toledo, on the west coast, where a concession has been granted. It is also reported from Asturias, to the north of Toledo on the same coast, and from Alegria to the south. Natural gas is said to exist in the Cebu coal fields. On Panay, too, oil is reported at Janinay, in the province of Iloilo, and gas is reported from the same island. Petroleum highly charged with paraffin is also found on Leyte at a point about four miles from Villaba, a town on the west coast. Gold is found at a vast number of localities in the archipelago, from northern Luzon to central Mindanao. In most cases the gold is detrital, and is found either in existing water-courses, or in stream deposits now deserted by the current. Copper ores are reported from a great number of localities in the Philippines. A lead mine has been partially developed near the town of Cebu, and there is iron ore in abundance in Luzon, Caraballo, Cebu, Panay, and doubtless in other islands. Sulphur deposits abound about active and extinct volcanoes in the Philippines.

A REUTER correspondent at Cadiz reports that the coffin containing the remains of Christopher Columbus has been opened. It was found to contain about thirty bones and some ashes. The coffin was then closed again and conveyed on board the despatch boat *Giralda*, which was to leave on Wednesday for Seville, where the remains of Columbus will be received with great ceremony and deposited in the cathedral.

THE prize awards of the Paris Academy of Medicine are announced in the *British Medical Journal*. This year, as usual, the most noteworthy features were the decisions of the Academy as to the Audiffred, Laborie, Chevillon, and Adrien Buisson prizes. Two years ago Madame Audiffred gave a capital sum, estimated to produce an income of 2400 francs (960*l.*), to be awarded as a prize to any one who shall discover a means of curing or preventing tuberculosis. Among the serious workers who competed, special mention is made of Dr. Auclair, of Paris, who has made interesting researches on the substances extracted from the tubercle bacillus, and has shown that the fatty matters contained in excess in the bacillus are necrosing agents, and doubtless play a part in the resistance of the bacilli to phagocytosis. A sum of 80*l.* was awarded to him by way of encouragement, while 20*l.* was given on the same ground to Drs. Auché and Hobbs of Bordeaux. The Laborie prize (200*l.*), for the best work in surgery, was divided between MM. Poncet and Bérard of Lyons. The Chevillon prize of 60*l.* is given for the best work on the treatment of cancerous diseases. This year a portion of it (40*l.*) was awarded to Drs. A. Guinard and Livet, who have used carbonate of calcium as a local application with considerable success as far as the relief of pain and the arrest of hæmorrhage and the prevention of fœter are concerned. The Buisson prize consists of a sum of 420*l.*, awarded triennially to the discoverer of methods of curing diseases regarded as incurable. This year there were only three competitors: Dr. Frenkel, who propounded a method of training whereby ataxic patients may be drilled into the recovery of muscular coordination; Dr. Jayle, who has made a series of investigations as to the practical utility of ovarian extract in the treatment of nervous and circulatory disorders accompanying dysmenorrhœa and the menopause, whether natural or artificial; and Dr. Petit, who presented a thesis on tuberculosis of the glands of the neck. The Academy did not see its way to award the prize, but gave 40*l.* each to Dr. Frenkel and Dr. Jayle, and 20*l.* to Dr. Petit by way of encouragement.

THE performances of the submarine vessel, *Gustave Zédé*, appear to have given much satisfaction to naval experts on the other side of the Channel, though our own engineering papers are by no means impressed by the experiments. We learn from the *Times* that the semi-official *Moniteur de la Flotte*, commenting upon the trials of the *Gustave Zédé*, says that at length, after twelve years of continued efforts, the problem has been solved. The *Gustave Zédé*, unassisted, has steamed from Toulon to the Salins d'Hyères and to Marseilles, sometimes on the surface and sometimes submerged, and has successfully discharged her missiles at the mark. On the surface she is almost invisible, and presents a target scarcely capable of being hit; below water her presence is revealed neither by the noise of her engine nor any movement of the surface. The objection raised against the submarine boat that she is blind loses force, since the *Gustave Zédé* makes momentary appearances on the surface to redirect her course, while she has a telescopic tube, with an arrangement of prisms and mirrors, utilising the principle of the *camera obscura*, which permits the surroundings to be surveyed, though imperfectly, in case of emergency. The *Gustave Zédé* has a restricted range, owing to the great weight of the electric accumulators; but the new boats of the Narval class will have auxiliary steam for surface navigation.

SOME interesting particulars with reference to the White Star liner *Oceanic*, which was successfully launched from the Belfast ship-yard of Messrs. Harland and Wolff at the end of last week, and is the longest and heaviest ship yet projected from a slipway, are given in *Engineering* of January 13. The following table shows how the new vessel compares with others:—

Steamer's name.	Date.	Moulded dimensions.						Draught.		Displacement.
		Length.		Breadth		Depth.				
		ft.	in.	ft.	in.	ft.	in.	ft.	in.	
Great Eastern	1858	680	0	83	0	57	6	25	6	27,000
Britannic	1874	455	0	45	0	36	0	23	6	8,500
Arizona	1879	450	0	45	2	37	6	22	0	—
Servia	1881	515	0	52	0	40	6	23	3	9,900
Alaska	1881	500	0	50	0	39	8	22	0	—
City of Rome ...	1881	542	6	52	0	38	9	22	0	11,230
Oregon	1883	500	0	54	0	40	0	23	0	—
Paris	1888	527	6	63	0	41	10	23	0	13,000
Teutonic	1890	565	0	57	6	42	2	22	0	12,000
Campania ...	1893	600	0	65	0	41	6	23	0	—
Kaiser Wilhelm der Grosse ...	1897	625	0	66	0	43	0	—		20,000
Oceanic	1899	685	0	68	0	49	0	32	6	28,500

The displacement of 28,500 tons given in the table for the new vessel is that at the load draught, which, as stated, is 32 feet 6 inches. The passenger accommodation of the *Oceanic* will be for 410 first-class passengers, 300 second-class, and 1000 third-class passengers, whilst the officers, crew, and other members of the ship's company will be 394, bringing the total up to 2104 persons.

ON Thursday last (January 12) the whole of the British Islands experienced a storm of unusual violence, which caused much loss of life and damage to property both on land and at sea. The storm was noteworthy because of the suddenness of its appearance and the rapidity with which it travelled, as well as for the area which it covered; for while the centre of the disturbance passed over Scotland, its fury was felt far to the south of the English Channel. On the morning of the previous day the Weather Chart published by the Meteorological Office showed that, although small secondary depressions were crossing our islands from west to east, the symptoms were favourable for an improvement of the recent unsettled weather, and the observations taken at 6h. p.m. on Wednesday showed that the barometer was steady or rising all along the western coasts. The chart for 8h. a.m. of Thursday showed that the barometer had fallen more than half an inch at some stations during the night, and that the northern part of Ireland was already experiencing the full force of the gale that had suddenly set in from the Atlantic; at Belmullet, in the north-west of Ireland, force 12 of the Beaufort wind-scale, or a complete hurricane, was blowing. During the day it rapidly spread to other parts of the country, a heavy south-west gale was blowing in the Channel, with terrific seas, and very heavy gusts and rainfall were experienced in London. By the next morning (Friday) the centre of the disturbance was passing over Germany and the Baltic, the storm area having travelled at the unusually high rate of about thirty-four miles an hour.

AT the Institution of Civil Engineers, on January 10, a paper was read on "High-speed Engines," by Mr. J. H. Dales. In applying provisions for eliminating knock in double-acting engines, Mr. Dales has found that the ordinary rates of rotation can, with practical immunity from overheating, and an absolute freedom from seizure of bearings, be exceeded to the extent of 30 per cent. to 50 per cent. This has been effected by providing a close-up, and at the same time expansible, adjustment of bearing brasses, and so reducing the production of heat to only that caused by the rotation of a shaft as distinguished from the usual cause of seizure—namely, the expansive force of the metal of both journal and brasses.

ON August 15 and September 17, 1897, three earthquakes occurred in Turkestan, which, considering their comparatively slight intensity, were recorded by horizontal and other pendulums over a very wide area, the most distant station being more than 5000 km. from the epicentre. In each case the estimates of the velocity vary greatly, and Dr. Agamennone, who has studied the records, considers that the differences are to be ascribed to the variety of the instruments employed, rather than to any uncertainty in the time-records. It is important to notice that the highest velocities are always given by the Italian pendulums, which therefore appear, in spite of their mechanical system of registration, to be the most sensitive to these disturbances.

THE publication of Cohn's *Beiträge zur Biologie der Pflanzen* will not be discontinued owing to the death of Prof. Cohn. It will still be brought out, as heretofore, at irregular intervals, under the editorship of Prof. O. Brefeld, his successor in the chair of Botany at the University of Breslau.

THE *Botanical Gazette* announces two expeditions for the purpose of discovering food-plants and others of economical value suitable for introduction into the United States—one by Mr. W. T. Swingle, to the Mediterranean coasts of Europe, Asia, and Africa; the other by Mr. D. G. Fairchild and Mr. B. Lathrop, to both coasts of South America.

The addition to the British flora of a species belonging to so well-known and conspicuous an order as the Orchideæ, is an unexpected circumstance. Mr. H. Goss has been fortunate enough to accomplish this in the case of *Orchis cruenta*, Muhl., which he has found growing abundantly in several spots in boggy ground at an altitude of about 1000 feet, between Borrowdale and Watendlath, in Cumberland. *O. cruenta* is nearly related to *O. incarnata* and *O. latifolia*, being regarded by some authorities as a variety of the latter. The discovery is especially interesting as adding one more to the small number of specially Arctic plants comprised in our flora. It has hitherto been known only in Norway, Sweden, and Finland. It should be looked for in Scotland.

In a paper published in the *Annals of Botany* for December, Mr. H. Wager appears to have set at rest the much-disputed question of the presence of a nucleus in yeast-cells. In all the species of *Saccharomyces* examined—*S. Cerevisiae*, *Ludwigii*, *pastorianus*, and *Mycoderma*—he finds what he calls a "nuclear apparatus," that is, a special portion which appears to be set apart to perform the function of a nucleus. This nuclear body is perfectly homogeneous, even when observed under the highest powers of the microscope, and appears to correspond rather with the nucleole of higher plants. One of these bodies is found in every yeast-cell. In addition to the nuclear body, there is in every yeast-cell a structure of the nature of a vacuole, which appears to be an essential part of the nuclear apparatus, and to possess some of the attributes of a nucleus. This structure has often been mistaken for the nucleus itself.

Prof. W. B. Clark, State Geologist, reports, in the *Johns Hopkins University Circular* for November, on the progress of the Maryland Geological Survey and Maryland Weather Service during the session 1897–98. Established in 1896, the aim of the Survey has been to inaugurate those investigations which would prove most beneficial to the people of the State, and at the same time contribute most largely to the knowledge of the stratigraphy and structure of the country. With the aid of a surveying force provided by the United States Geological Survey, a large area has been surveyed topographically on the scale of an inch to a mile. The geological work is systematically divided, and a competent man placed in charge of each large district. Subjects such as the highways and road-metals, agriculture and soils, distribution of plant and animal life, and terrestrial magnetism are dealt with by officers specially chosen for the purpose. Prof. G. P. Merrill conducted investigations on the building and decorative stones. Statistical data are collected regarding the output of each industry that has to do with the mineral wealth of the State. The Survey, in short, is conducted in a way that reflects the highest credit on the State Geologist. As director of the State Weather Service, he carries on this branch of work in close co-operation with the State Geological Survey, the State Agricultural Institutions, and the United States Department of Agriculture. Reports from the State Weather Service are promised upon the physiography, meteorology, medical climatology, agricultural soils, forestry, hydrography, crop conditions, botany, and zoology of Maryland.

We have received, from Messrs. J. Elster and H. Geitel, an excerpt paper from *Terrestrial Magnetism* for June last, on a method of determining the direction of vertical electrical currents in the atmosphere by observations of atmospheric electricity. In connection with this subject, we would draw attention to an important article by Mr. W. Trabert in *Meteorologische Zeitschrift* for November last, on the connection between the phenomena of terrestrial magnetism and the electrical processes in the atmosphere, in which special reference is made to the above paper. Messrs. Elster and Geitel have pointed out that the direction of any vertical current from the surface of the earth, induced by a process analogous to electrical dissipation or conduction, is completely determined by the sign of the electricity of the ground, or, what is the same thing, by the sign of the potential over the corresponding locality. Thus if the surface of the earth is everywhere negatively charged, there must be a downward vertical current due to conduction. But they also point out that cases are imaginable in which the conveyance of electricity occurs in the opposite direction, and must be traced to some other process, either mechanical or one which is at present quite unknown. It may possibly be due to the effects of terrestrial magnetism, and be detected by measurements of atmospheric electricity.

An elaborate series of tests on cadmium standard cells has been undertaken by Mr. S. N. Taylor (*Physical Review*, vol. vii. pp. 149–170, 1898). The ratio of the E.M.F. of the Clark cell (15° C.) to the Cadmium cell (21·7°) is given as 1·4077; this may be compared with the Reichsanstalt determination, 1·4063, and with the recently published value, 1·40663, of Jaeger and Kahle, *Zeitschr. für. Instrk.*, June 1898. Assuming that the E.M.F. of the Clark cell is 1·433 volts, the Cadmium cell has an E.M.F. of 1·0180 volts. But the value of the Clark cell is not definitely established to the third decimal place; its E.M.F. is variously stated as follows:—Rayleigh, 1885, 1·4345; Carhart, 1·434; Glazebrook and Skinner, 1892, 1·4342; Kahle, 1896, 1·4322.

The new issue of *Natural Science*, which has lately changed hands, differs little from the numbers with which we have for some years been familiar. The original communications include the Friday evening address delivered by Prof. W. J. Sollas before the British Association at Bristol, on "Funafuti: the Study of a Coral Atoll." Mr. T. J. Cunningham discusses in detail Prof. Weldon's evidence of the operation of natural selection, expressed in the presidential address before the section of biology at the same meeting of the Association. Mr. H. C. Wyld writes on biological analogy and speech development, and Dr. A. T. Masterman contributes an article upon the subject of symmetry of organisms. In addition to these articles, there are the usual critical notes and comments, reviews, a budget of fresh facts, and items of news.

The *Transactions* of the Leicester Literary and Philosophical Society, New Series, vol. v. Parts 1 and 2 (July and October, 1898), contain the following papers on entomology: "A Group of Insects' Home-made Cradles," by G. B. Dixon; "Notes on the British Longicornes," by Horace Donisthorpe; "On the Genera Depressaria and Gelechia," by Rev. Canon Cruttwell; and "On the Evolution of the Hind Wing in Lepidoptera," by W. J. Kaye. The *Proceedings* of the Sections include numerous shorter notes on various branches of natural history, though entomology seems to receive the lion's share of the attention of the naturalists belonging to this energetic local society.

Bound in a strong handsome cover, and containing excellent illustrations from beginning to end, volume ix. of the *Practical Photographer* (Percy Lund, Humphries, and Co., Ltd., London) consists of the issues for the past twelve months, and forms a volume which every amateur photographer would like to possess. Among the numerous articles will be found interesting criticisms of the pictures exhibited at the various photographic exhibitions held during the year, practical notes on the different branches of the art, descriptions of the styles of work, and illustrations of pictures taken by some of the more well-known photographers, and many other subjects too numerous to mention, but which are of practical use to the amateur. Great pains have apparently been taken to ensure the successful reproductions of the pictures included in the 370 pages which compose this volume, and a perusal of even these alone may give hints to many amateurs on the somewhat difficult tasks of lighting, pose, &c.

THE additions to the Zoological Society's Gardens during the past week include a Gazelle (*Gazella dorcas*, ♀) from Egypt, presented by Mr. J. S. N. Allison; a White-cheeked Hill Partridge (*Arboricola atrigularis*) from the Naga Hills, Assam, presented by Mr. K. S. Cassells; a Regent Bird (*Sericulus melinus*, ♂) from Australia, a Weka Rail (*Ocydromus australis*) from New Zealand, a Black-headed Lemur (*Lemur brunneus*), bred in the Gardens, deposited; two Gluttons (*Gulo luscus*, ♂ ♀) from Northern Europe, a Common Otter (*Lutra vulgaris*), British; three Australian Rails (*Rallus pectoralis*), two White-cheeked Honey-eaters (*Meliphaga sericea*) from Australia, a Red Ground Dove (*Geotrygon montana*) from South America, purchased.

OUR ASTRONOMICAL COLUMN.

COMET CHASE.—This comet, which is now about as bright as it was at the time of its discovery last year, has the following ephemeris for the current week:—

Berlin Midnight.

1899.	R.A. (app.). h. m. s.	Dec. (app.). ° ′
Jan. 21	11 9 55	+32 27·7
23	9 55	32 50·7
25	9 48	33 13·4
27	9 35	33 35·9
29	11 9 16	+33 57·9

VELOCITY IN THE LINE OF SIGHT OF η PEGASI.—In a previous number of the *Astrophysical Journal* (vol. viii. No. 3), Prof. Campbell pointed out that his observations had indicated that the motion in the line of sight of the star η Pegasi (R.A. 22h. 38·2m., Dec. + 29° 41′·2, mag. 3·1) is variable. Writing in the *Astronomische Nachrichten* (No. 3536), Herr Belopolsky tells us that he is able to corroborate this statement from observations made by him at the Pulkova Observatory. The following are the results of his measures of this star, the number in the last two columns representing the velocities per second in geographical miles, in relation to the earth and sun respectively.

	Motion relative to	
	Earth	Sun.
1897 Aug. 27	−1·70	−0·66
Sept. 8	−1·03	−0·64
1898 Aug. 25	+1·27	+2·29
Sept. 17	+3·05	+2·26

The mean of Belopolsky's values for the two years thus reduce to −4·8 and +16·9 kilometres per second, while those of Campbell for 1897 July–September and 1898 August–September, are given as −4·3 and +16·2 kilometres per second. These values it will be noticed agree well with one another, and indicate further the accuracy that can now be obtained in such measures.

THE LEONIDS IN 1898.—In the December number of the *Monthly Notices* there are several communications on the meteors seen in November last, to which we have not yet drawn our readers' attention. At the Cape Observatory, Dr. Gill had made special provision for obtaining both eye observations and photographs on the nights of the 13th and 14th.

For the latter work, five cameras were arranged to cover the region round the radiant point, while a Cooke doublet was directed towards the radiant. All the cameras were fixed to equatorials, and the plates changed every hour. No photographic results were obtained, and, indeed, the eye observations indicated that the shower was nothing out of the ordinary. No more fortunate was Dr. Copeland, who, with some assistants, watched on the nights of the 13th to 15th. At Cambridge, Mr. Hinks, who with several other observers kept their vigil during the same three evenings until dawn, and were perhaps a little more fortunate on the 14th, when from 11h. to 18h. thirty-two Leonids were seen.

The shower seems, however, to have been better seen in America, as will be gathered from the following extracts of a letter from Prof. Barnard to Dr. Johnstone Stoney. Prof. Barnard watched on the nights of the 11th–16th, between the hours 5 p.m.–6 a.m.

He writes:—"The sky cleared shortly after midnight on the 14th. I soon saw there were a few meteors, but not noticeable, which could be traced back to the radiant, though they were mostly low in the north-west, near α Cygni. They became more frequent, and some large ones were seen. From this till daylight several hundreds were seen—many of the first magnitude, and a few brighter. Very few were seen near the radiant, and none at it." As regards the time of greatest frequency of the meteors, Prof. Barnard says:—"It seemed to me the maximum was reached between 3 and 4 a.m., perhaps nearer 4. It was the finest display of meteors I have yet seen."

On the 16th and 17th, not a single Leonid was observed by Prof. Barnard. Five cameras were employed to record the trails, but the development of the least promising of them has given no trails.

NEW INSTRUMENT FOR MEASURING ASTROGRAPHIC PLATES.—Now that photography is so largely used for obtaining charts of the stars, several styles of measuring instruments have been devised to obtain directly the coordinates of the star discs from the negatives. The great difficulty in designing such instruments is that simplicity of construction, accuracy of measurement, and rapidity of working must be well combined. The most recent form is that which we owe to Dr. Gill, and which will be found fully described and illustrated in the *Monthly Notices of the R.A.S.* (vol. lix. No 2). While taking advantage of the rapidity of Prof. Turner's method, Dr. Gill has retained the accuracy which is attainable with the filar micrometer. The result, as Dr. Gill states, has fully realised his expectations, "thanks to the artistic skill and care of Messrs. Repsold, to whom I entrusted the carrying out of my plans." The whole process of measurement is "so simple that an observer without any previous knowledge or experience in practical work of the kind can, after very short training, easily measure the two coordinates of eighty stars per hour (including diameters); and were it not that the observers are instructed to work very carefully, a larger number could be measured in the same time."

THE SPECTRUM OF THE CORONA.[1]

THE announcement by Prof. Nasini of the possible presence of the characteristic green line of the corona in the spectrum of the gases collected at the Solfatara of Pozzuoli (NATURE, vol. lviii. p. 269, July 21, 1898) renders it desirable that I should at once publish some of the results of an investigation relating to the spectrum of the corona with which I have lately been occupied.

In the course of my early observations of the spectrum of the chromosphere, I discovered on June 6, 1869, a bright line at 1474 on Kirchhoff's scale, which I stated to be coincident with a line of iron (*Roy. Soc. Proc.*, vol. 18, p. 76).

During the total eclipse of the sun on August 7, 1869, a green line was recognised by Prof. Young as belonging to the spectrum of the corona, and the position of this line was also stated to be 1474K.

Although other determinations of the position of the green line of the corona during eclipses have not all agreed absolutely with Young's observations, the differences have been attributed to errors of observation, so that Young's statement of the coincidence of the coronal and chromospheric lines, and their correspondence with the solar dark line at 1474K has been generally accepted. No special attention appears to have been directed of late years to the measurement of the corona line itself.

This and other coronal radiations were photographed as rings by the use of prismatic cameras in 1893, 1896, and 1898, but a full list of them has only so far been published for the photo-

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[1] Paper read before the Royal Society on November 24, by Sir Norman Lockyer, K.C.B., F.R.S